EXHIBIT C

Trials@uspto.gov   Paper 9
571-272-7822   Date: August 17, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

———————————

BEFORE THE PATENT TRIAL AND APPEAL BOARD

———————————

XEROX CORP., ACS TRANSPORT SOLUTIONS, INC., XEROX
TRANSPORT SOLUTIONS, INC., CONDUENT INC., AND NEW
JERSEY TRANSIT CORP.,
Petitioner,

v.

BYTEMARK, INC.,
Patent Owner.

———————————

IPR2022-00621
Patent No. 10,346,764 B2

———————————

Before BENJAMIN D. M. WOOD, BARRY L. GROSSMAN, and
JAMES A. TARTAL, *Administrative Patent Judges.*

GROSSMAN, *Administrative Patent Judge.*

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

IPR2022-00621
Patent No. 10,346,764 B2

I.   INTRODUCTION

A.   Background and Summary

Xerox Corp., ACS Transport Solutions, Inc., Xerox Transport
Solutions, Inc., Conduent Inc., and New Jersey Transit Corp. (collectively,
"Petitioner") filed a Petition (Paper 1, "Pet.") requesting an *inter partes*
review of claims 1–28 (the "challenged claims") of U.S. Patent No.
10,346,764 B2 (Ex. 1001, "the '764 patent"). Bytemark, Inc. ("Patent
Owner") filed a Preliminary Response (Paper 7, "Prelim. Resp.").

We have jurisdiction under 35 U.S.C. § 314. Under § 314, an *inter
partes* review may not be instituted "unless . . . there is a reasonable
likelihood that the petitioner would prevail with respect to at least 1 of the
claims challenged in the petition." 35 U.S.C. § 314(a). The Board
determines whether to institute a trial on behalf of the Director. 37 C.F.R.
§ 42.4(a).

Petitioner has the burden of proof. *Harmonic Inc. v. Avid Tech., Inc.*,
815 F.3d 1356, 1363 (Fed. Cir. 2016) ("In an IPR, the petitioner has the
burden from the onset to show with particularity why the patent it challenges
is unpatentable.").

For the reasons set forth below, we determine that Petitioner has
demonstrated that there is a reasonable likelihood that at least one of the
challenged claims is unpatentable. Accordingly, we institute an *inter partes*
review of all challenged claims and on all grounds asserted in the Petition.

B.   Real Parties-in-Interest

Petitioner states "Xerox Corp., ACS Transport Solutions, Inc., Xerox
Transport Solutions, Inc., Conduent Inc., and New Jersey Transit Corp." are
real parties-in-interest. Pet. 60.

IPR2022-00621
Patent No. 10,346,764 B2

Patent Owner identifies itself as the sole real party-in-interest.
Paper 4, 2.

C.   Related Matters

Patent Owner states "[t]he '764 Patent is presently the subject of the following patent infringement actions brought by Patent Owner: *Bytemark, Inc. v. Xerox Corp. et al.*, Case No. 1:17-cv-01803 (S.D.N.Y.); and *Bytemark, Inc. v. Masabi Ltd.*, Case No. 6:22-cv-00304 (W.D. Tex.). Paper 4, 2.

Petitioner identifies the New York litigation identified by Patent Owner as the sole related matter.

We note that a related patent to which the '764 patent claims priority, U.S. Patent No. 8,494,967 B2 (the "'967 patent") (*see* Ex. 1001, code (63)), was the subject of IPR2017-01449 and CBM2018-00011. Petitioner in the IPR proceeding now before us also was the Petitioner in CBM2018-00011.

In IPR2017-01449, the Board specifically construed some claim terms and found some claims of the '967 patent unpatentable. This decision was affirmed by the Federal Circuit. *See* Ex. 3001.

In CBM2018-00011, the Board declined to institute a proceeding because the '967 patent is not a "covered business method patent" eligible for a CBM proceeding.

We also note that Petitioner is challenging in IPR2022-00624 another patent, Patent No. 10,360,567 (the '567 patent") assigned to Patent Owner. The '567 patent, titled "Method and System for Distributing Electronic Tickets *with Data Integrity Checking*," and the '764 patent in the proceeding before us, titled "Method and System for Distributing Electronic Tickets *with Visual Display for Verification*," each claim priority to the patent

IPR2022-00621
Patent No. 10,346,764 B2

application that matured into U.S. Patent 9,239,993 (emphasis added to highlight the differences in titles).

D. The '764 patent

As stated above, the '764 patent is based on a continuation application claiming priority to the application that matured into the '967 patent, which was the subject of IPR2017-01449. The figures and written description in both the '764 patent and the '967 patent are essentially identical. We have not been directed by the parties to any persuasive evidence of a substantive difference between the figures and written description in these two patents.

The '764 patent discloses a system and method for verifying electronic tickets. The system and method use a "visual object" that is readable by a person to verify the authenticity of the ticket. Ex. 1001, Abstr. According to the disclosure, using such a visual object removes the need to use a bar-code scanner on an LCD display of a cell phone or other device and speeds up the rate at which ticket takers can verify ticket holders. *Id.*

As disclosed in the '764 patent,

> Conventional electronic tickets display a barcode or QR code on a user's telephone, typically a cellphone or other portable wireless device with a display screen. The problem with this approach is that a barcode scanner has to be used by the ticket taker. Barcode scanners are not highly compatible with LCD screen displays of barcodes. The amount of time that it takes to process an electronic ticket is greater than that of a paper ticket.

Id. at 2:19–26.

To solve this problem, a randomly selected validation symbol that a human can readily recognize is sent to the ticket holder's cell phone or other electronic device. Examples of such symbols include a color display (Ex. 1001, 3:48), a sailboat (*id.*, Fig. 5), or any other human recognizable

IPR2022-00621
Patent No. 10,346,764 B2

image (*id.*, 3:48–61). The ticket holder shows the device with the displayed symbol to a human ticket taker who can confirm quickly, without using a bar-code scanner or similar device, that the proper validating symbol for the ticketed event is displayed. The ticket holder is then admitted to enter the event.

Recited in all the challenged claims, and part of the process of verifying or validating that the request is from the purchaser, or authorized user, of the ticket, is the use of a "token." When the user purchases a ticket, typically from an on-line website, the website sends to the user's mobile phone, computer, or other device a unique number or other electronic identifier, referred to as a "token." Ex. 1001, 2:53–63. In addition to being stored on the user's device, the token also is stored in the ticketing database. *Id.* at 2:66–67. Alternatively, the token is generated randomly by the ticket buyer's mobile computing device and then transmitted to, and stored on, the ticket seller's system server. In either embodiment, a copy of the token is stored on both the buyer's and seller's systems.

At this point in the process, the ticket buyer has purchased a ticket, but does *not* have a ticket usable for entry to the event.

When the time comes to present the ticket, the venue selects what visual indicator will be used as the designated validation visual object. *Id.* at 2:67–3:3. Thus, counterfeit tickets cannot be prepared in advance of the event because counterfeiters will not know the visual indicator that will be used. *Id.* at 3:19–31.

In use:

> At the entrance [to the ticketed event], customers are requested to operate an application on their devices. This application fetches the stored ticket token [on the ticket buyer's device] and

5

IPR2022-00621
Patent No. 10,346,764 B2

transmits that token to the [ticket seller's on-line] system, preferably over a secure data channel. The [ticket seller's] database looks up the token to check that the token is valid for the upcoming show. If the token is valid, then the system transmits back to the device a ticket payload. The ticket payload contains computer code that, when operated, displays the selected validating visual object.

Id. at 4:20–29.

The ticket taker knows what the validating visual object is for the specific event, and simply looks to see that the user's device is displaying the correct visual object. *Id.* at 3:16–18. No scanning or bar code reading is required. *Id.* at 2:31–34 ("the verification is determined by a larger visual object that a human can perceive without a machine scanning it."). Barcodes and similar codes, like QR code, are not validating "visual objects" because a person looking at them cannot tell one apart from another.

As a further aid against piracy, the ticket payload can "contain code that destroys the validating visual object in a pre-determined period of time after initial display or upon some pre-determined input event." Ex. 1001, 3:25–28.

E.   Illustrative Claims

Petitioner challenges claims 1–28. Claims 1 and 10 are independent claims.

Independent claim 1 is illustrative and is reproduced below with bracketed labels employed by Petitioner to facilitate analysis and discussion.

> 1. [1pre] A method performed by a computer system for displaying visual validation of the possession of a previously purchased electronic ticket for utilization of a service monitored by a ticket taker comprising:
>   [1a] transmitting a token associated with a previously purchased electronic ticket to a remote display device, wherein

6

IPR2022-00621
Patent No. 10,346,764 B2

the token is a unique identifier and a copy of the unique identifier is stored on a central computer system;

[1b] validating the token by matching the token transmitted to the remote display device to the copy of the unique identifier stored on the central computing system to provide a ticket payload to the remote display device;

[1c] transmitting to the remote display device a validation display object associated with the ticket payload, the validation display object being configured to be readily recognizable visually by the ticket taker, in order to enable the remote display device to display the validation display object so that upon visual recognition by the ticket taker, the user of the remote display device is permitted to utilize the service monitored by the ticket taker; and

[1d] wherein the ticket payload contains code that destroys the validating visual object in a predetermined period of time after initial display or upon some pre-determined input event.

Ex. 1001, 14:39–64.

Independent claim 10 is substantially similar to claim 1 but is directed to a "system for validating previously purchased electronic tickets," rather than the method in claim 1.

F.   Prior Art and Asserted Grounds

Petitioner asserts that one or more of the challenged claims would have been obvious on the following two grounds:

IPR2022-00621
Patent No. 10,346,764 B2

Claim(s) Challenged	35 U.S.C. §[1]	Reference(s)/Basis
1–19, 22, and 24–28	103(a)	Terrell[2] and Saarinen[3]
20, 21, and 23	103(a)	Terrell, Saarinen, and Arimori[4]

Petitioner also relies on the Declaration testimony of Dr. Mark T.

Jones. *See* Ex. 1003.[5]

II.   ANALYSIS

A. Legal Standards

Section 103 forbids issuance of a patent when "the differences

between the subject matter sought to be patented and the prior art are such

that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said

subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406

(2007). The question of obviousness is resolved on the basis of underlying

---

[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 296–07 (2011), took effect on September 16, 2011. The changes to 35 U.S.C. §§ 102 and 103 in the AIA do not apply to any patent application filed before March 16, 2013. Because the application for the patent at issue in this proceeding claims priority to applications filed before March 16, 2013, we refer to the pre-AIA version of the statute.
[2] PCT Appl. Publication No. 2009/141614 A1, Nov. 26, 2009, Ex. 1005 ("Terrell").
[3] U.S. Appl. Publication No. 2008/0071637 A1, Mar. 20, 2008, Ex. 1006 ("Saarinan").
[4] Japanese Application No. JP2001266178A, Sept. 28, 2001, Ex. 1007 ("Arimori").
[5] Dr. Jones earned a B.S. degree in Computer Science and Computer Engineering and a Ph.D. degree in Computer Science. He currently is a Professor Emeritus of Electrical and Computer Engineering at Virginia Tech University in Blacksburg, Virginia. Ex. 1003 ¶ 4. His extensive experience in academia and research in the field of computer science is summarized in his testimony. *See id.* ¶¶ 4–12; *see also* Ex. 1004 (Dr. Jones' CV).

IPR2022-00621
Patent No. 10,346,764 B2

factual determinations, including: (1) the scope and content of the prior art;
(2) any differences between the claimed subject matter and the prior art;
(3) the level of ordinary skill in the art; and (4) when available, evidence
such as commercial success, long felt but unsolved needs, and failure of
others.[6] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *see KSR*,
550 U.S. at 407 ("While the sequence of these questions might be reordered
in any particular case, the [*Graham*] factors continue to define the inquiry
that controls."). The Court in *Graham* explained that these factual inquiries
promote "uniformity and definiteness," for "[w]hat is obvious is not a
question upon which there is likely to be uniformity of thought in every
given factual context." 383 U.S. at 18.

The Supreme Court made clear that we apply "an expansive and
flexible approach" to the question of obviousness. *KSR*, 550 U.S. at 415.
Whether a patent claiming the combination of prior art elements would have
been obvious is determined by whether the improvement is more than the
predictable use of prior art elements according to their established functions.
Id. at 417. To support this conclusion, however, it is not enough to show
merely that the prior art includes separate references covering each separate
limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655
F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires
that a person of ordinary skill at the time of the invention "would have
selected and combined those prior art elements in the normal course of
research and development to yield the claimed invention." *Id.*

---

[6] Patent Owner does not direct us to any objective evidence of non-
obviousness in its Preliminary Response.

IPR2022-00621
Patent No. 10,346,764 B2

In determining whether there would have been a motivation to combine prior art references to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason *why* a person of skill in the art would have made the combination. *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017).

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 164 (Fed. Cir. 1985) ("It is elementary that the claimed invention must be considered as a whole in deciding the question of obviousness."); *see also Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983) ("[T]he question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious. Consideration of differences, like each of the findings set forth in *Graham*, is but an aid in reaching the ultimate determination of whether the claimed invention *as a whole* would have been obvious.").

As a factfinder, we also must be aware "of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." *KSR*, 550 U.S. at 421.

Applying these general principles, we consider the evidence and arguments of the parties.

B.   Level of Ordinary Skill in the Art

The level of skill in the art is "a prism or lens" through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d

10

IPR2022-00621
Patent No. 10,346,764 B2

1350, 1355 (Fed. Cir. 2001). "This reference point prevents . . . factfinders from using their own insight or, worse yet, hindsight, to gauge obviousness." *Id.*

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Env't Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.* Moreover, these factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355.

Petitioner asserts that a person of ordinary skill in the art would have had "at least a Bachelor of Science Degree in Computer Science, Computer Engineering, or similar educational background, or equivalent on-the-job training, including approximately three years of experience in developing mobile applications." Pet. 5. Petitioner notes, however, that the proposed "level of skill is approximate and more experience would compensate for less formal education, and vice versa." Pet. 5. As examples, Petitioner states "an individual having no degree in engineering, but several years of experience developing mobile applications would qualify as a person of

IPR2022-00621
Patent No. 10,346,764 B2

ordinary skill in the art. A person having no experience developing mobile application but a masters or doctorate degree in the aforementioned fields may also qualify as a person of ordinary skill in the art." *Id.* (citing Ex. 1003, ¶ 14. Dr. Jones' Declaration testimony repeats Petitioner's conclusory argument, but prefaces it with the phrase "In my opinion." Ex. 1003 ¶ 14. We give his conclusory testimony minimal probative weight. 37 C.F.R. § 42.64(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Patent Owner asserts "a POSITA[7] in the timeframe of the invention would have had a bachelor's degree in computer engineering or similar discipline and approximately two years of experience designing mobile applications." Prelim. Resp. 6. Patent Owner cites no evidence to support its conclusory argument.

"The *Graham* analysis includes a factual determination of the level of ordinary skill in the art. Without that information, a . . . court cannot properly assess obviousness because the critical question is whether a claimed invention would have been obvious at the time it was made to one with ordinary skill in the art." *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *see also Ruiz v. A.B. Chance*, 234 F.3d 654, 666 (Fed. Cir. 2000) ("The determination of the level of skill in the art is an integral part of the *Graham* analysis.").

For purposes of this decision, based primarily on the prior art and the sophistication of the disclosed technology in the '764 patent, we determine

---

[7] An acronym commonly used in patent law jargon to refer to a person of ordinary skill in the art.

IPR2022-00621
Patent No. 10,346,764 B2

that the level of ordinary skill is a bachelor's degree in computer science or

computer engineering or in a similar relevant engineering or science

discipline and two years of relevant experience, or an equivalent balance of

education and work experience.

C. Claim Construction

We construe each claim "using the same claim construction standard

that would be used to construe the claim in a civil action under 35 U.S.C.

[§] 282(b)." 37 C.F.R. § 42.100(b) (2021). Under this standard, claim terms

are generally given their ordinary and customary meaning as would have

been understood by a person of ordinary skill in the art at the time of the

invention and in the context of the entire patent disclosure. *Phillips v. AWH*

Corp., 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc) ("We have

frequently stated that the words of a claim 'are generally given their ordinary

and customary meaning.'" (citations omitted)).

Petitioner does "not propose any terms for an express construction and

analyze[s] each claim term according to its plain and ordinary meaning."

Pet. 7.

Patent Owner states "[f]or the purposes of institution, Patent Owner

agrees with [Petitioner] that no term requires express construction." Prelim.

Resp. 6 (citing Pet. 14). Notwithstanding its statement that the claims do not

require "express construction," Patent Owner asserts that "the method of

claim 1 must be read as reciting a specific order of steps, and the same order

must be read in the structure of corresponding system claim 10." *Id.* at 6–7.

Patent Owner asserts,

> claims [1 and 10] require—in order—steps of (1) transmitting a
> token to a remote display device, (2) validating the token by
> matching the token transmitted to the remote display device to

IPR2022-00621
Patent No. 10,346,764 B2

> the copy of the unique identifier stored in the central computing system, (3) transmitting a validating visual object to the remote display device, (4) displaying on the remote display device the validating visual object, and then (5) ***after*** a predetermined period of time from when the validating visual object is displayed or upon a pre-determined input event, the validating visual object is destroyed.

Prelim. Resp. 6–8. The proposed order is essentially the order of the method steps in claim 1 and the order of the system processes in claim 10. In support of its argument, Patent Owner cites our final decision in the related IPR2017-01449. *Id.* at 9 (citing IPR2017-01449, Paper 38 (Final Written Decision), 6, 28, 60–61). This citation confirms the close relationship between the disclosure and claims in the '967 patent in IPR2017-01449 and the disclosure and claims in the '764 patent in the proceeding before us.

As a general rule, "[u]nless the steps of a method [claim] actually recite an order, the steps are not ordinarily construed to require one." *Mformation Techs., Inc. v. Rsch. in Motion Ltd.*, 764 F.3d 1392, 1398 (Fed. Cir. 2014) (citing *Interactive Gift Express, Inc. v. Compuserve Inc.,* 256 F.3d 1323, 1342 (Fed. Cir. 2001). However, a claim "requires an ordering of steps when the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written, or the specification directly or implicitly requires" an order of steps. *Id.* at 1398-99 (quoting *TALtech Ltd. v. Esquel Apparel, Inc.,* 279 Fed. Appx. 974, 978 (Fed. Cir. 2008); *see also Function Media, LLC v. Google, Inc.*, 708 F.3d 1310, 1320 (Fed. Cir. 2013) (concluding that a claim that recites "processing" an "electronic advertisement" necessarily indicates that "the creation of the ad must happen before the processing begins"). Thus, as disclosed, there is a logical order to the steps performed.

IPR2022-00621
Patent No. 10,346,764 B2

For purposes of this Decision, as in *Mformation*, we agree that the claim language logically requires that the process steps be performed in sequence. *See Amgen Inc. v. Sandoz Inc.*, 923 F.3d 1023, 1028 (Fed. Cir.), *reh'g granted, opinion modified*, 776 F. App'x 707 (Fed. Cir. 2019). This also is consistent with the written description in the '764 patent.

For an example of the ordered steps, as disclosed in the '764 patent, the written description states that *after* the ticket purchaser buys a ticket, the ticket seller's "website" sends to the purchaser's device "a unique number, referred to as a token," which is stored on the buyer's device. Ex. 1001, 2:53–66. This same unique number, or token, also is stored in the seller's database. *Id.* at 2:66–67. Thus, according to the Specification, this single token is stored in two different places.

Ticket holders that have purchased tickets have a data record in the seller's database that contains the unique token associated with the ticket. *Id.* at 4:16–20. At the entrance to the event or service, customers are requested to operate an application on their devices. *Id.* at 4:20–22. The application retrieves from the buyer's device the stored ticket token and transmits that token to the seller's system. *Id.* at 4:22–23. The seller's database *first* looks up the buyer's token to check that the token is "valid." *Id.* at 4:24–25. The Specification does not state the characteristics, criteria, or method of determining what constitutes a "valid" ticket. It appears to involve merely comparing the token received by the buyer to the token stored in the seller's database. *If the token is valid, then* the seller's system transmits back to the buyer's device a "ticket payload," which contains computer code that, when operated, displays the "validating visual object."

15

IPR2022-00621
Patent No. 10,346,764 B2

Ex. 1001, 4:25–29. The "validating visual object" is selected by the seller. *Id.* at 3:1–3.

Our preliminary claim construction in this Decision, concerning the order of the steps as claimed, does not preclude the parties from arguing their proposed constructions of the claims during trial. Indeed, this Decision puts the parties on notice that claim construction, in general, is an issue to be addressed at trial and will be resolved in any final decision, based on the complete record in this proceeding.

D. Ground 1 – Claims 1–19, 22, and 24–28 in View of Terrell and Saarinen

Petitioner asserts claims 1–19, 22, and 24–28 are unpatentable under § 103(a) as obvious in view of Terrell and Saarinen. Pet. 10–49. First, we summarize these two references.

1. Terrell (Ex. 1005)

Terrell discloses a method of electronic ticketing "in which an image is displayed by a mobile device that is eye-readable for inspection purposes." Ex. 1005, 2:8–9.[8] As stated in Terrell, "[f]or the purposes of speed and economy, at times it may be preferable for such a ticket inspection to be merely done by the inspector's eyes." *Id.* at 4:16–17. The electronic tickets disclosed in Terrell include "both a visually readable component that

---

[8] We note that Petitioner's cites to Terrell are to the original page numbers (top, center) of the exhibit and not the exhibit page number added by Petitioner in the bottom right corner of each page of Exhibit 1005. Thus, for example, Petitioner's cite to Ex. 1005, "2:7–13" (Pet. 7) is a citation to text appearing on page 2 of the original document, lines 7–13, which also is labeled by Petitioner as "Exhibit 1005 – Page 003." To avoid additional confusion, we also will cite to the original document page number and *not* the exhibit page number added by Petitioner.

IPR2022-00621
Patent No. 10,346,764 B2

may be inspected by eye and also a machine-readable code that is readable by electronic reading apparatus." *Id.* at 4:18–20.

Terrell discloses that the mobile device "displays graphical information comprising textual information and animated graphics" on the viewable screen "*for visual inspection,*" and also "presents a machine-readable code to allow *authentication* of said textual information." *Id.* at 3:3–6 (emphasis added). Thus, Terrell distinguishes between "inspection," which uses the graphical information, and "authentication," which uses the machine-readable code.

The Figure 16 embodiment of Terrell concerns validating a previously purchased, but non-validated, electronic ticket. Ex. 1005, 18:8–10. Because the Figure 16 embodiment incorporates substantial portions of other embodiments, we first describe Terrell's disclosure in general, and then discuss the Figure 16 embodiment.

As disclosed in Terrell, electronic tickets are provided by the ticket seller's server to mobile devices of ticket buyers, such as mobile phones. *Id.* at 4:5–6; *see also id.* at Figs. 6, 13 and *id.* at 8:18–9:14; 15:19–16:8 (illustrating and describing Terrell's ticket purchase procedures). The ticket buyer's mobile device sends to the seller's server a request to purchase a ticket to a selected event. *Id.* at 16:3–8. The seller's server responds by sending the buyer a ticket having a unique ticket number. *Id.* The server has access to a "verification database." *Id.* at 4:30. Tickets supplied by the server to the mobile devices include a unique ticket number, along with other details, all of which are stored in the verification database. *Id.* at 5:1–4; 16:3–8.

17

IPR2022-00621
Patent No. 10,346,764 B2

The server sends to the mobile device a ticket with a graphical information part and a machine-readable part, such as a barcode. *Id.* at 9:16–18; Fig. 7. The graphical information part includes data that is to be presented as "human-readable information" on the mobile device display. *Id.* at 9:19–20. The "human-readable" graphical information part includes data defining a unique ticket number (as stored in verification database 111), a date relating to the event for which the ticket was bought, a code for the day, a "valid to" time, other ticket details, and "non-textual graphical information." *Id.* at 9:21– 26.

The mobile device executes "an application" on the mobile device, which displays the text information and graphics "for visual inspection," and the machine-readable code "to allow authentication" of the textual information. *Id.* at 2:13–17. The mobile device application requires at least one graphic element to be animated, i.e., to have a change in appearance, such as by movement, change in form, change in color, or a change in size. *Id.* at 10:26–29.

The ticket information transmitted to the ticket purchaser includes a "valid for" time (*id.* at 12:2–3), and a "code for the day" (*id.* at 13:8–9).

Figure 11 of Terrell, reproduced below, illustrates an example of the "human-readable" graphical information on a mobile phone, which includes a "valid for" time 1104, a unique ticket number 1106, a code for the day 1107, and a non-text graphic. *Id.* at 13:8–21. Button 1109 allows a user to request that the barcode part of the ticket be displayed. *Id.* at 13:27–28. The barcode is shown in Figure 12. Where the screen resolutions and dimensions of the buyer's mobile device permit, the entire ticket, including

IPR2022-00621
Patent No. 10,346,764 B2

the "human-readable" graphical information and barcode, may be presented

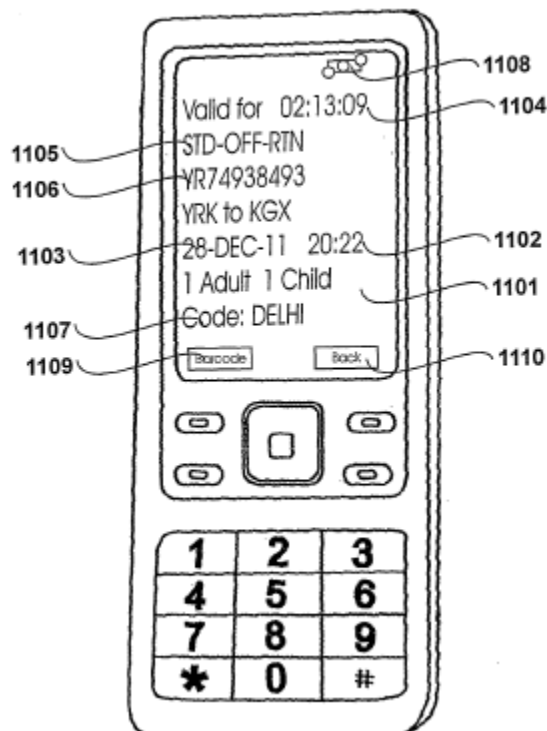simultaneously on a single screen. *Id.* at 15:15–17.

Figure 11 shows a mobile device displaying
graphical information included in a ticket.

By viewing the code for the day 1107 and/or the "valid for" time

1104, a ticket inspector can easily observe that the ticket appears to be a

valid ticket. *Id.* at 13:18–20.

The barcode may be read to obtain the unique ticket number which is

then compared with unique ticket number 1106, as shown in Figure 11.

Id. at 14:7–8. According to Terrell, this provides a simple check of the

ticket's authenticity. *Id.* at 14:9. Where a database of unique ticket numbers

is available, this ticket number can also be checked against such a database

to ensure that it is valid. *Id.* at 14:9–11.

19

IPR2022-00621
Patent No. 10,346,764 B2

Terrell also discloses that the data to be included in the graphical information part of the ticket data is encrypted using a symmetric private key obtained from the mobile device. *Id.* at 17:6–14. A part of the symmetric key comprises a selected part of the IMEI number of the requesting mobile device. *Id.* at 17:15–17. When the ticket is received back at the requesting mobile device, the *application resident on the receiving mobile device* ensures that the selected part of its IMEI number is present in the symmetric key. *Id.* at 17:17–19. If it is not present, the decryption of the graphical information part of the ticket data is blocked. *Id.* at 17:19–21. Terrell discloses that "this feature ensures that the IMEI number of the receiving mobile device matches the IMEI number of the requesting mobile device, and if not then decryption using the symmetric key is prohibited." *Id.* at 17:19–21.

As described above, Terrell provides a validated ticket to the buyer. *Id.* at 18:7–8. In an alternative embodiment, however, Terrell discloses that a ticket is provided to the buyer's mobile device in a *non-validated form*, and is validated in a separate transaction initiated by the buyer. *Id.* at 18:8–10. An example of a non-validated ticket is shown in Figure 16 of Terrell.

Figure 16 of Terrell is reproduced below.
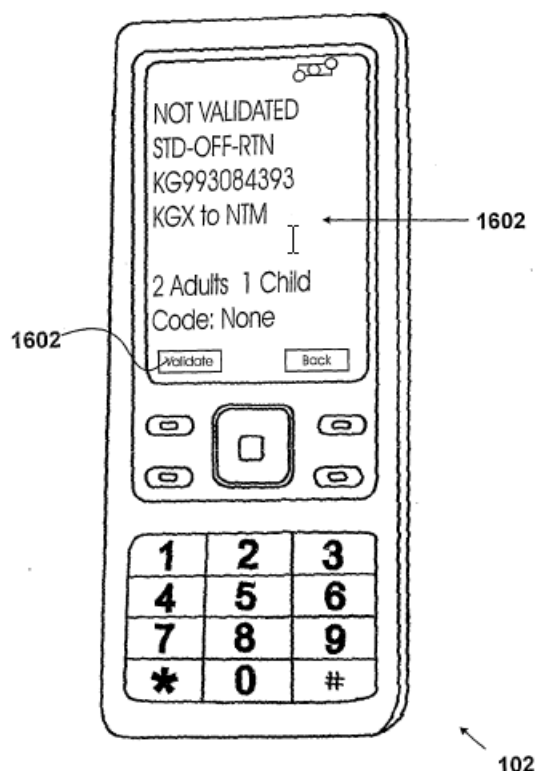
IPR2022-00621
Patent No. 10,346,764 B2

Figure 16 shows an example of a non-validated ticket.

As shown in Figure 16, the words "not validated" are displayed on the ticket. *Id.* at 18:19–26. The non-validated ticket does *not* show the "valid to" time or a decrementing "valid for" time. *Id.* The non-validated ticket also does not include a date or corresponding "code for the day." *Id.*

When the buyer wants to use the non-validated ticket, the buyer validates the ticket by pressing "validate" button 1602 (Figure 16), which replaces barcode button 1109 shown in Figure 11. *Id.* at 18:27–30. The validation request asks the seller's server to validate a ticket having a specified unique ticket number. *Id.*

Upon receiving the request, the server responds by assembling the required data, including date, code for the day, and "valid to" time. *Id.* at 18:30–19:5. The assembled data is transmitted to the requesting mobile

21

IPR2022-00621
Patent No. 10,346,764 B2

device, so that the application can update the pre-validation ticket to a validated ticket, such as shown in Figures 11 and 12. *Id.*

2.   *Saarinen (Ex. 1006)*

Saarinen discloses a method and apparatus for providing an "active" ticket in a mobile terminal for use by a mobile terminal user. Ex. 1006 ¶ 16. The "active" ticket has a ticket characteristic that dynamically changes based on one or more states in a life cycle of the ticket. *Id.* The various life cycle states of the ticket may be "purchased," "pre-valid," "validated," or "invalid." *Id.* ¶ 17. Dynamic changes to the ticket characteristic include either multimedia changes or other presentation data, including text, sound, animation, video, and still pictures. *Id.* ¶ 16. The ticket service provider or issuer can send new control data to change the characteristic and/or contents of the active ticket. *Id.* ¶ 17. This information is sent only to the mobile terminal of the original purchaser of the active ticket, so unauthorized (i.e. pirated) tickets, if any, will not receive this updated information. *Id.* Moreover, using this control data, it is also possible to change the characteristic or appearance of the ticket. *Id.*

This control data is a part of the ticket but is received, for example, at a certain time and/or location, or just before the ticket is about to be used. *Id.* ¶ 19. The control data is sent only to legally purchased tickets. *Id.* After receiving the control data, the active ticket is easily distinguishable from the illegal ones. *Id.* According to Saarinen, the disclosed method and system "allows ticket validation without machines" and "validation by the human eye is easy." *Id.* ¶ 20.

IPR2022-00621
Patent No. 10,346,764 B2

3.   Analysis of Independent Claims 1 and 10

The issues and arguments raised by Patent Owner for independent claims 1 and 10 are substantially similar. Thus, we discuss these claims together.

Petitioner provides a clause-by-clause analysis of claim 1, explaining where, in Petitioner's view, each element is disclosed in Terrell or Saarinen, and why claim 1, considered as a whole, would have been obvious. Pet. 15–29. Petitioner provides a similar analysis for claim 10. *Id.* at 37–38. Throughout its clause-by-clause analysis, Petitioner cites to the disclosures of the references and to Dr. Jones' testimony for evidentiary support.

Patent Owner argues that Petitioner "has not met its burden of showing a reasonable likelihood that it would prevail with respect to any claim because the Petition does not show that the prior art teaches or suggests the order of steps required by claims 1 and 10." Prelim. Resp. 10. Patent Owner does *not* cite any evidence to support this argument.

Patent Owner asserts only two specific examples of the alleged failure of the cited references to disclose or suggest the ordered steps of the claimed invention. Patent Owner asserts:

(1) the prior art does not disclose "transmitting a token to a remote display device and then validating the token by matching the transmitted token to the copy of the unique identifier stored on the central computing system" (*id.*); *see also id.* at 11–14 (further arguing this same point) and

(2) the prior art also does not disclose "'code that destroys the validating visual object in a predetermined period of time after initial display or upon some pre-determined input event' but instead at most discloses code that deletes a ticket at a time when it is no longer valid (Terrell) or after the

IPR2022-00621
Patent No. 10,346,764 B2

ticket is used (Saarinen)" (*id.* at 10–11); *see also id.* at 14–18 (further

arguing this same point).

> a) *Transmitting a Token, then Validating the Token*

We use independent method claim 1 as a specific example. The

limitations in independent systems claim 10 are essentially identical. Patent

Owner does not argue claims 1 and 10 separately.

> Clause 1[a] states:
>
> transmitting a token associated with a previously purchased
> electronic ticket to a remote display device, wherein the token is
> a unique identifier and a copy of the unique identifier is stored
> on a central computer system.

Ex. 1001, 14:43–47.

> Clause 1[b] states:
>
> validating the token by matching the token transmitted to the
> remote display device to the copy of the unique identifier stored
> on the central computing system to provide a ticket payload to
> the remote display device.

Ex. 1001, 14:48–51.

As asserted by Petitioner, and discussed below, Terrell (Pet. 15–21)

and Saarinen (*id.* at 11–12) discloses a method and apparatus for electronic

ticketing that disclose these steps performed in the order recited in the

challenged claims. Petitioner asserts "Terrell inherently discloses 'matching

the token transmitted to the remote display device to the copy of the unique

identifier stored on the central computing system' during the validation

process." *Id.* at 21. In fact, Terrell expressly discloses this limitation, as

asserted by Petitioner. *Id.* ("Terrell already discloses the explicit matching

of ticket numbers for validity and fraud prevention." (citing Ex. 1003 ¶ 49)).

IPR2022-00621
Patent No. 10,346,764 B2

In Terrell, electronic tickets are provided by the ticket seller's server to mobile devices of ticket buyers, such as mobile phones. Ex. 1005, 4:5–6; *see also id.* at Figs. 6, 13 and *id.* at 8:18–9:14; 15:19–16:8 (illustrating and describing Terrell's ticket purchase procedures). The ticket buyer's mobile device sends to the seller's server a request to purchase a ticket to a selected event. *Id.* at 16:3–8. The seller's server responds by sending the buyer a ticket having a unique ticket number. *Id.* The server has access to a "verification database." *Id.* at 4:30. Tickets supplied by the server to the mobile devices include a unique ticket number, along with other details, all of which are stored in the verification database. Ex. 1005, 5:1–4; 16:3–8.

The server sends to the mobile device a ticket with a graphical information part and a machine-readable part, such as a barcode. *Id.* at 9:16–18; Fig. 7. The graphical information part includes data that is to be presented as "human-readable information" on the mobile device display. *Id.* at 9:19–20. The "human-readable" graphical information part includes data defining a unique ticket number (as stored in verification database 111), a date relating to the event for which the ticket was bought, a code for the day, a "valid to" time, other ticket details, and "non-textual graphical information." *Id.* at 9:21– 26.

The mobile device executes "an application" on the mobile device, which displays the text information and graphics "for visual inspection," and the machine readable code "to allow authentication" of the textual information. *Id.* at 2:13–17. The mobile device application requires at least one graphic element to be animated, i.e., to have a change in appearance, such as by movement, change in form, change in color, or a change in size. *Id.* at 10:26–29.

IPR2022-00621
Patent No. 10,346,764 B2

The ticket information transmitted to the ticket purchaser includes a "valid for" time (*id.* at 12:2–3), and a "code for the day" (*id.* at 13:8–9).

In validating a previously non-validated ticket, and responding to a request for validation from the buyer (Ex. 1005, 18:30 ("Upon receiving the request . . .")) Terrell discloses that the seller's server sends to the buyer's mobile device the required validation data, including a "code for the day." *Id.* at 19:1–5. This is simply a "day specific code." *Id.* at 13:9. The buyer's mobile device uses this data to update the "pre-validation ticket" to a "validated ticket." Ex. 1005, 13:9. As shown in Figure 11 of Terrell, the example code for the day 1107 is "DELHI." This word is an object that is readily recognizable from human observation that can verify a ticket, and thus, is within our construction of the term "visual validation display object." Indeed, Terrell discloses that the purpose of the code for the day is to allow a ticket inspector to "easily . . . observe that the ticket appears to be a valid ticket." *Id.* at 13:18–20.

Terrell specifically discloses that the code of the day is transmitted as part of a data file that includes various codes and commands, including barcode data. As disclosed in Terrell,

> Upon receiving the request the server responds by assembling the required *data*, including date, code for the day, 'valid to' time, and generating the corresponding barcode *data*, as previously described. The assembled *data* and the barcode *data* are then transmitted to the requesting mobile device, so that the application can update the pre-validation ticket to a validated ticket.

Ex. 1005, 18:30–19:5 (emphases added).

26

IPR2022-00621
Patent No. 10,346,764 B2

Accordingly, based on the record before us, Terrell discloses first transmitting a token, or a unique identifier, to a user's device, then validating the token at a later time.

b) *Code that Destroys the Validating Visual Object*

Clause 1[d] of the '764 patent states:

wherein the ticket payload contains code that destroys the validating visual object in a predetermined period of time after initial display or upon some pre-determined input event.

Ex. 1001, 14:61–64. As explained in the written description, one way the disclosed method limits piracy is that "the ticket payload can contain code that destroys the validating visual object in a pre-determined period of time after initial display or upon some pre-determined input event." *Id.* at 3:25–28.

Petitioner asserts "Terrell discloses a 'decrementing timer' which indicates a 'valid to' time for a previously purchased ticket. Pet 23 (citing Ex. 1005, 10:26–11:5; 18:30–19:3). When the 'valid to' time expires, the decrementing timer ceases to display a time and the ticket is no longer valid. *Id.* at 13:15-20; 19:11–15 ("[T]he mobile device displays the time the ticket was created, the time the ticket expires, and the time remaining [until] expiry."). As explained by Petitioner, "[a]t that point, the face of the ticket indicates that the ticket is no longer valid because the validating visual object (the decrementing timer) has been destroyed since it has been changed to show that no time remains for use of the previously valid ticket. *Id.* at 24 (citing Ex. 1003 ¶ 53). Petitioner concludes that "[t]he 'valid to' time is an element of 'code' in the ticket payload (the 'required data') that is sent to the user's device from the server when the user validates the previously purchased ticket." Pet. 25 (citing Ex. 1005, 18:30–19:3; Ex.
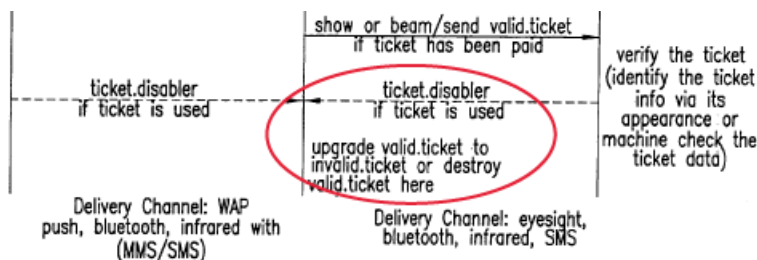
IPR2022-00621
Patent No. 10,346,764 B2

1003 ¶ 55). This is a "pre-determined input event" as recited in the

challenged claims.

Alternatively, Petitioner asserts Saarinen teaches a method to

"destroy" previously valid tickets. Pet. 27. According to Petitioner,

> it would have been obvious to a POSITA to include code in the
> ticket package that will automatically delete the old ticket once a
> predetermined period of time has passed (e.g., once the timer
> recognizes that the time for the event has passed) or modify the
> appearance of the ticket to show an 'invalid ticket appearance'
> once a predetermined time has passed or a 'predetermined input
> event' has occurred.

Id. (citing Ex. 1003 ¶ 59; Ex. 1006, Figs. 8a–8c). As Petitioner notes (Pet.

27–28), Figures 8a and 8c of Saarinen, and the written description (Ex. 1006

¶ 117), disclose a process for disabling or "destroying" a valid ticket, so that

it is no longer useable. Saarinen discloses that "[a]fter the ticket is used,

either the ticket issuer server or the ticket inspector may disable the active

ticket by either upgrading the valid ticket to an invalid ticket or destroying

the valid ticket." Ex. 1006 ¶ 117. This is a "pre-determined input event," as

recited in the claims.

An excerpt from Figure 8c of Saarinen is reproduced below and

annotated with a red circle to highlight the relevant text.

FIG.8c: Location–Based Active Ticketing Protocol

As shown in Figure 8c, Saarinen discloses a "ticket disabler" that will

"upgrade valid ticket to invalid ticket or destroy valid ticket."

IPR2022-00621
Patent No. 10,346,764 B2

According to Petitioner, "it would have been obvious to a POSITA to include code to remove the used ticket in the ticket payload." Pet. 29 (citing Ex. 1006 ¶ 74; Ex. 1003 ¶ 60). Paragraph 74 of Saarinen refers to "ticket application module 22b'," which is the code, software, or processing steps to perform the assigned function of "destroying" the valid ticket.

Patent Owner asserts that "[n]either Terrell nor Saarinen discloses a specific ordering of steps including destroying a validating visual object after a predetermined period of time starting from when the validating visual object is displayed or upon a pre-determined input event as claimed." Prelim. Resp. 15. Patent Owner does not cite any persuasive evidence to support this asserted conclusion. We disagree with this conclusion, based on the record before us.

Patent Owner recognizes that Terrell discloses a "decrementing timer," and that Petitioner relies, in part, on this disclosure for the claim limitation of code for destroying a valid ticket. *Id.* ("For Terrell, the Petition alleges that 'Terrell discloses a 'decrementing timer' which indicates a 'valid to' time for a previously purchased ticket."). As Patent Owner acknowledges, when the "valid to" time expires, the ticket is no longer valid. *Id.* Patent Owner argues, however, that "Terrell's 'valid to' time indicates the amount of time after the user has ***requested*** a valid ticket, not an amount of time after the user has ***displayed*** a valid ticket." *Id.* (citing Ex. 1005, 9:23; 19:27-20:5). These argued limitations, however, do not appear in independent claims 1 and 10. Accordingly, we give them no probative weight on the record before us.

29

IPR2022-00621
Patent No. 10,346,764 B2

c) *Conclusion for Claims 1 and 10*

Based on the arguments and evidence in the record before us, we determine, for purposes of this Decision, Petitioner has established a reasonable likelihood that independent claims 1 and 10 would have been obvious based on Terrell and Saarinen; that Petitioner has established a reason why a person of ordinary skill would have combined these references, with a reasonable expectation of success in doing so.

4. *Dependent Claims 2–9, 11–19, 22, and 24–28*

Dependent claims 2–9, 11–19, 22, and 24–28 depend directly or indirectly from claims 1 and 10. Petitioner provides a clause-by-clause analysis of where each element in dependent claims 2–9, 11–19, 22, and 24–28 is disclosed in, or would have been obvious in view of, Terrell and Saarinen. Pet. 29–49. Throughout Petitioner's analysis, Petitioner cites and relies on the testimony of Dr. Jones (Ex. 1003) for evidentiary support.

Patent Owner does not specifically address any of the dependent claims.

We find Petitioner's arguments and evidence in support thereof sufficient at this stage of the proceeding for the reasons explained by Petitioner. *See* Pet. 29–49.

Accordingly, based on the arguments and evidence on the record before us, we determine, for purposes of this Decision, Petitioner has established a reasonable likelihood of prevailing on dependent claims 2–9, 11–19, 22, and 24–28.

IPR2022-00621
Patent No. 10,346,764 B2

E. Ground 2 – Claims 20, 21, 23
in View of Terrell, Saarinen, and Arimori

Petitioner asserts claims 20, 21, and 23 are unpatentable under § 103(a) as obvious in view of Terrell, Saarinen, and Arimori. Pet. 50–55. We first summarize the disclosure in Arimori.

1. Arimori (Ex. 1007)

Arimori is titled "Electronic Ticket System Using Mobile Terminal." Ex. 1007, code (54).

Arimori discloses a system to provide an electronic ticket that "can be acquired anywhere at any time and can be used with [a] manned ticket inspection and ticket checking." Ex. 1007, Abstr. In Arimori, a mobile terminal, such as a mobile phone, can be used to purchase passenger or commuter tickets electronically and enables the mobile device itself to serve as a ticket. *Id.* ¶¶ 5, 7, 8; Ex. 1003 ¶ 33. The mobile device can then be used to access an event by sending information from the mobile device to an automatic ticket inspection device (Ex. 1007 ¶ 14) or a manned ticket gate with a mobile ticket checker device (*id.* ¶ 15) to confirm the validity of the ticket. Ex. 1003 ¶ 33.

Identity verification is carried out in the mobile terminal. Ex. 1007 ¶ 13. Specifically, the mobile terminal has a voice recognition function, and therefore the individual is identified either by voice recognition through cross-referencing with preregistered voiceprint data. *Id.* Alternatively, a camera is attached to the mobile terminal and retina recognition is carried out through cross-referencing with preregistered retinal image data. *Id.* Another alternative is that the individual can be identified through manual or voice input of a user ID and password. *Id.*

IPR2022-00621
Patent No. 10,346,764 B2

2.   Analysis of Claims 20, 21, and 23

Claims 20, 21, and 23 are each a "system" claim, and each claim depends from claim 17, which, in turn, depends from claim 10.

Claim 20 further limits claim 17 by reciting that "the predetermined manner of actuation is the input of a code into the remote device by the user." Ex. 1001, 16:35–37. Claim 21 further limits claim 17 by reciting that "the predetermined manner of actuation is the input of a sound into the remote device." *Id.* at 16:38–40. Claim 23 further limits claim 17 by reciting that "the predetermined manner of actuation is input of a predetermined visual image." *Id.* at 16:45–47.

Petitioner provides an element-by-element analysis of where each element in the challenged claims is disclosed in, or would have been obvious in view of, the cited references. Pet. 53–55. Petitioner also provides a reason why it would have been obvious to modify and combine the references with a reasonable expectation of success, as proposed by Petitioner. *Id.* Petitioner also relies on the testimony of Mr. Jones (Ex. 1003) for evidentiary support.

Patent Owner asserts that Arimori does not compensate for the deficiency Patent Owner argued in Terrell and Saarinen, which is that these references do not disclose the ordered steps discussed in Ground 1 (Prelim. Resp. 18), an assertion we did not accept on this record.

Accordingly, based on the arguments and evidence of Petitioner on the record before us, we determine, for purposes of this Decision, Petitioner has established a reasonable likelihood of prevailing on claims 20, 21, and 23 challenged in Ground 2.

IPR2022-00621
Patent No. 10,346,764 B2

III. CONCLUSION

We have determined that there is a reasonable likelihood that
Petitioner will prevail on at least one challenged claim. Accordingly, we
institute an *inter partes* review on all challenged claims on each asserted
ground. A decision to institute is "a simple yes-or-no institution choice
respecting a petition, embracing all challenges included in the petition."
PGS Geophysical AS v. Iancu, 891 F.3d 1354, 1360 (Fed. Cir. 2018).

Our review of the Petition under 35 U.S.C. § 314 is not to determine
whether an individual asserted fact is indisputable or whether a
preponderance of the evidence supports Petitioner. Our review is to
determine whether the totality of the information presented in the Petition
and Preliminary Response shows that there is a reasonable likelihood that
Petitioner would prevail with respect to at least one of the claims challenged
in the Petition. "The 'reasonable likelihood' standard is a somewhat flexible
standard that allows the Board room to exercise judgment." Patent Trial and
Appeal Board Consolidated Trial Practice Guide at 53 (Nov. 2019),
available at https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf.

This is a decision to institute an *inter partes* review under 35 U.S.C.
§ 314. Our determinations at this stage of the proceeding are preliminary,
and based on the evidentiary record developed thus far. This is not a final
decision as to the patentability of claims for which *inter partes* review is
instituted. Any final decision will be based on the record as fully developed
during trial, including all arguments and evidence in the Patent Owner's

IPR2022-00621
Patent No. 10,346,764 B2

Response,[9] Petitioner's Reply, Patent Owner's Sur-reply, or submitted

otherwise during trial, as permitted by our rules.

<div align="center">IV. ORDER</div>

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is

instituted as to claims 1–28 of the '764 patent on each ground set forth in the

Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and

37 C.F.R. § 42.4(b), *inter partes* review of the '542 patent shall commence

on the entry date of this Decision, and notice is hereby given of the

institution of a trial.

---

[9] *See In re Nuvasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016) (explaining
that a patent owner waives an issue presented in its preliminary response if it
fails to renew the issue in its response after trial is instituted).

IPR2022-00621
Patent No. 10,346,764 B2

FOR PETITIONER:

Ashley Moore
Scott Hejny
Eliza Beeney
MCKOOL SMITH P.C.
amoore@mckoolsmith.com
shejny@mckoolsmith.com
ebeeney@mckoolsmith.com

FOR PATENT OWNER:

James T. Carmichael
Minghui Yang
Carmichael IP, PLLC
jim@carmichaelip.com
mitch@carmichaelip.com